



Permanent endoscopic reversal of Roux-en-Y gastric bypass for diagnosis and long-term palliation of pancreatic cancer

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Patients with Roux-en-Y gastric bypass (RYGB) anatomy face unique technical challenges in the management of pancreaticobiliary malignancy. ERCP is challenging in RYGB anatomy, and EUS is often technically impossible.^{1,2} Recently, temporary endoscopic reversal of RYGB anatomy has been reported, with EUS-guided deployment of an electrocautery-enhanced lumen-apposing metal stent (LAMS; AXIOS, Boston Scientific, Marlborough, Mass, USA) into the remnant stomach, thus gaining temporary access into the bypassed foregut and facilitating standard EUS/ERCP.³⁻⁶ Here, we describe a case of permanent RYGB reversal for palliation of pancreatic malignancy and discuss how to anticipate and manage technical issues during the procedure.

A 71-year-old woman with a history of sleeve gastrectomy converted to RYGB for morbid obesity presented with fatigue, diarrhea, jaundice, and disproportionate weight loss, with imaging revealing a pancreatic head mass with biliary obstruction (Fig. 1; Video 1, available online at www.VideoGIE.org). During a multidisciplinary discussion, permanent endoscopic RYGB reversal was proposed, in anticipation of progressive decline in nutritional status owing to bariatric surgery compounded by pancreatic malignancy.

EUS revealed a suitable target for accessing the remnant stomach at the jejunal blind limb. Initially, electrocautery-enhanced puncture into the remnant stomach was performed using a 20- × 10-mm LAMS.⁷ During the deployment process, the delivery catheter became stuck within the endoscope channel, and the distal flange of the stent began to open prematurely. The stent was fully deployed and retrieved, and the resulting perforation was immediately closed with 3 clips. The procedure was reattempted, and a 15- × 10-mm LAMS was successfully deployed, thus establishing a jejuno gastric access tract.

The access tract was only allowed to mature for 1 week owing to progressive obstructive jaundice. Subsequently, a linear echoendoscope was advanced across the LAMS. A sharp angulation was noted in the gastric antrum because of the patient's prior sleeve gastrectomy, which rendered endoscope insertion challenging. EUS-FNA was performed,

establishing a diagnosis of pancreatic adenocarcinoma. ERCP was performed using a therapeutic duodenoscope, with placement of a fully covered self-expanding metal biliary stent. During each endoscope withdrawal, a 0.035-inch guidewire was passed into the duodenum to secure the access tract, and the endoscope was exchanged over the guidewire.

During the final endoscope withdrawal, LAMS dislodgement was noted. With the guidewire in place, the dislodged LAMS was retrieved, the peritoneum was safely traversed, and a new 15- × 10-mm LAMS was deployed to reappose the separated gastric antrum to the jejunal blind limb. Given the instability of the access tract, the LAMS was additionally secured with two 10F double-pigtail plastic stents. The patient was able to tolerate a regular diet and completed chemotherapy. At 6-month follow-up, her weight was stable and CT imaging showed an intact LAMS.

EUS-guided RYGB reversal is intended to be temporary, with expectation of closure after completion of the necessary intervention in light of the risk of unintended reversal of the metabolic effects of bariatric surgery.⁶ However, permanent RYGB reversal may be considered in pancreaticobiliary malignancy, in anticipation of progressive decline in nutritional status and to facilitate additional procedures that may be necessary. In this case, approximately 8 months after the initial procedures and after completion of chemotherapy, the patient underwent EUS-guided fiducial placement via the LAMS (Fig. 2) in preparation for radiation therapy. At the time of the EUS-guided fiducial placement, the previously placed fully covered biliary stent could be neither endoscopically nor endosonographically visualized, consistent with complete spontaneous migration. Therefore, 1 week later she underwent ERCP via the LAMS with replacement of the biliary stent. At the conclusion of the ERCP, the existing LAMS was also exchanged over a guidewire to prevent mesh erosion.⁸

LAMS misdeployment and dislodgement are major risks with EUS-guided RYGB reversal and subsequent endoscopic procedures.⁴⁻⁶ In this case, we experienced both misdeployment because of delivery catheter malfunction and dislodgement because of the inherent

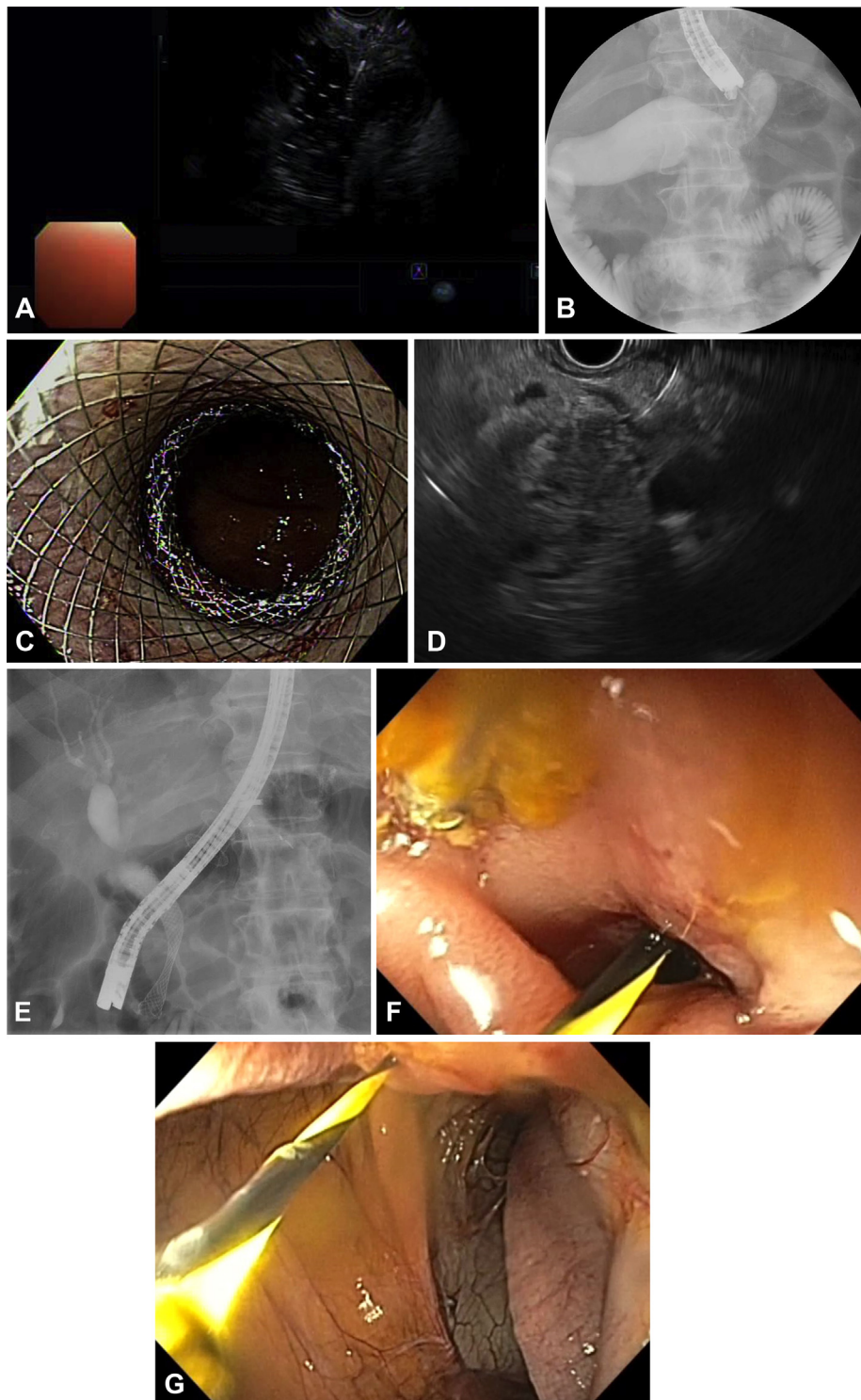


Figure 1. Permanent endoscopic reversal of Roux-en-Y gastric bypass for diagnosis and long-term palliation of pancreatic cancer. **A**, EUS-guided puncture of the remnant gastric antrum from the blind jejunal limb. **B**, Injection of contrast material into the remnant stomach. **C**, Creation of jejunogastric access tract with EUS-guided deployment of a lumen-apposing metal stent (LAMS). **D**, EUS-FNA of pancreatic head mass, confirmed to be adenocarcinoma via rapid on-site cytopathology. **E**, Fluoroscopic image showing completion of ERCP with placement of a fully covered self-expanding metal biliary stent. **F**, Dislodged LAMS after ERCP with 0.035-inch guidewire in place across jejunogastric access tract. **G**, The peritoneal cavity was safely traversed using the guidewire, and **(H)** a new 15 × 10-mm LAMS was deployed over the guidewire to reappose the separated gastric antrum to the jejunal blind limb. **I**, Fluoroscopic image showing intact LAMS and double-pigtail plastic stents. **J**, CT coronal view showing intact LAMS at 6-month follow-up.

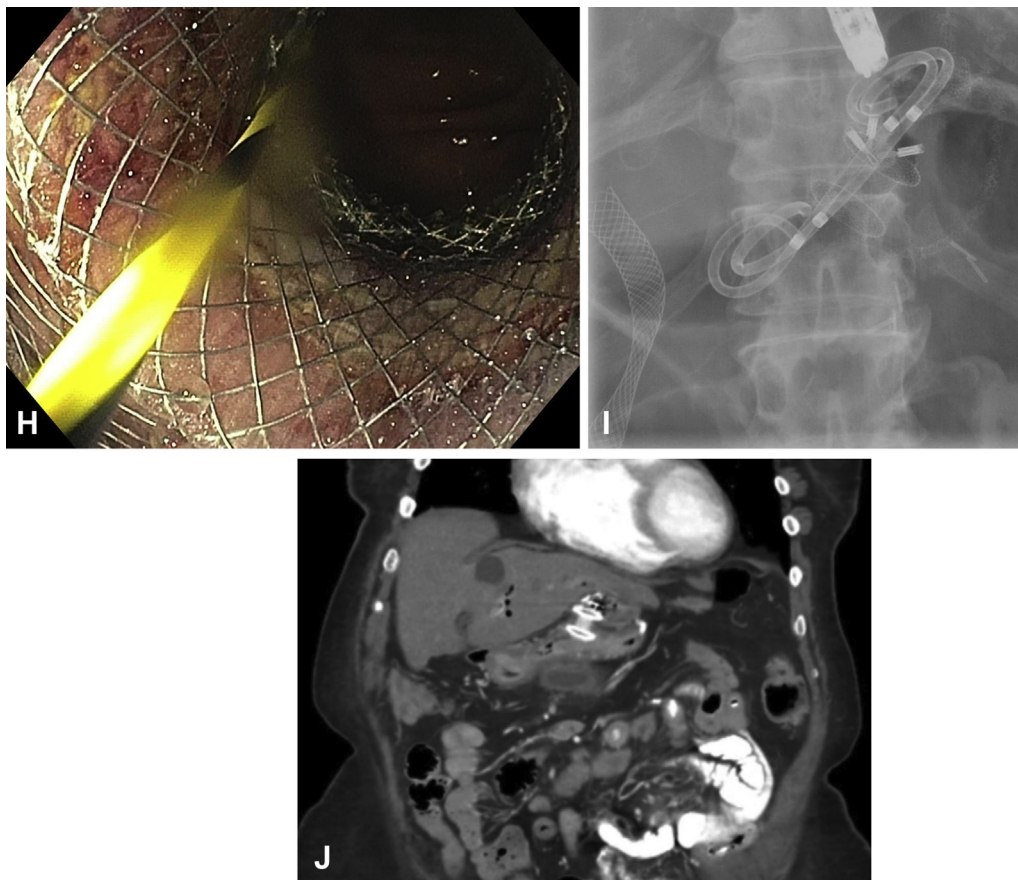


Figure 1. Continued.

instability associated with a jejunogastric access tract. To prevent delivery catheter malfunction and premature opening of the stent, the catheter should always be copiously lubricated with water before insertion into the endoscope working channel. In addition, to mitigate the risk of dislodgement, the endoscope should always be thoroughly lubricated and suction should never be applied during endoscope insertion or withdrawal across the LAMS. When technically feasible, gastrogastic access is recommended whenever permanent RYGB reversal is considered. When jejunogastric access is the only option, the tract requires at least 1 to 2 weeks to mature; in this case, we demonstrated that at 1 week, dislodgement had occurred in the setting of an immature jejunogastric access tract.

An important technical consideration in this case was preemptive placement of a guidewire into the duodenum during each endoscope withdrawal and exchange of the endoscope over the guidewire. This simple step allows

for a rapid and safe salvage in case of LAMS dislodgement. Finally, if dislodgement occurs, we recommend placing double-pigtail plastic stents across the LAMS to further secure the access tract.

In conclusion, permanent endoscopic RYGB reversal may be considered in patients with RYGB anatomy who develop pancreaticobiliary malignancy. This case demonstrates the feasibility and versatility of this approach and highlights various safety and technical considerations.

DISCLOSURE

Dr Coronel is a consultant for Boston Scientific. All other authors disclosed no financial relationships.

Abbreviations: LAMS, lumen-apposing metal stent; RYGB, Roux-en-Y gastric bypass.

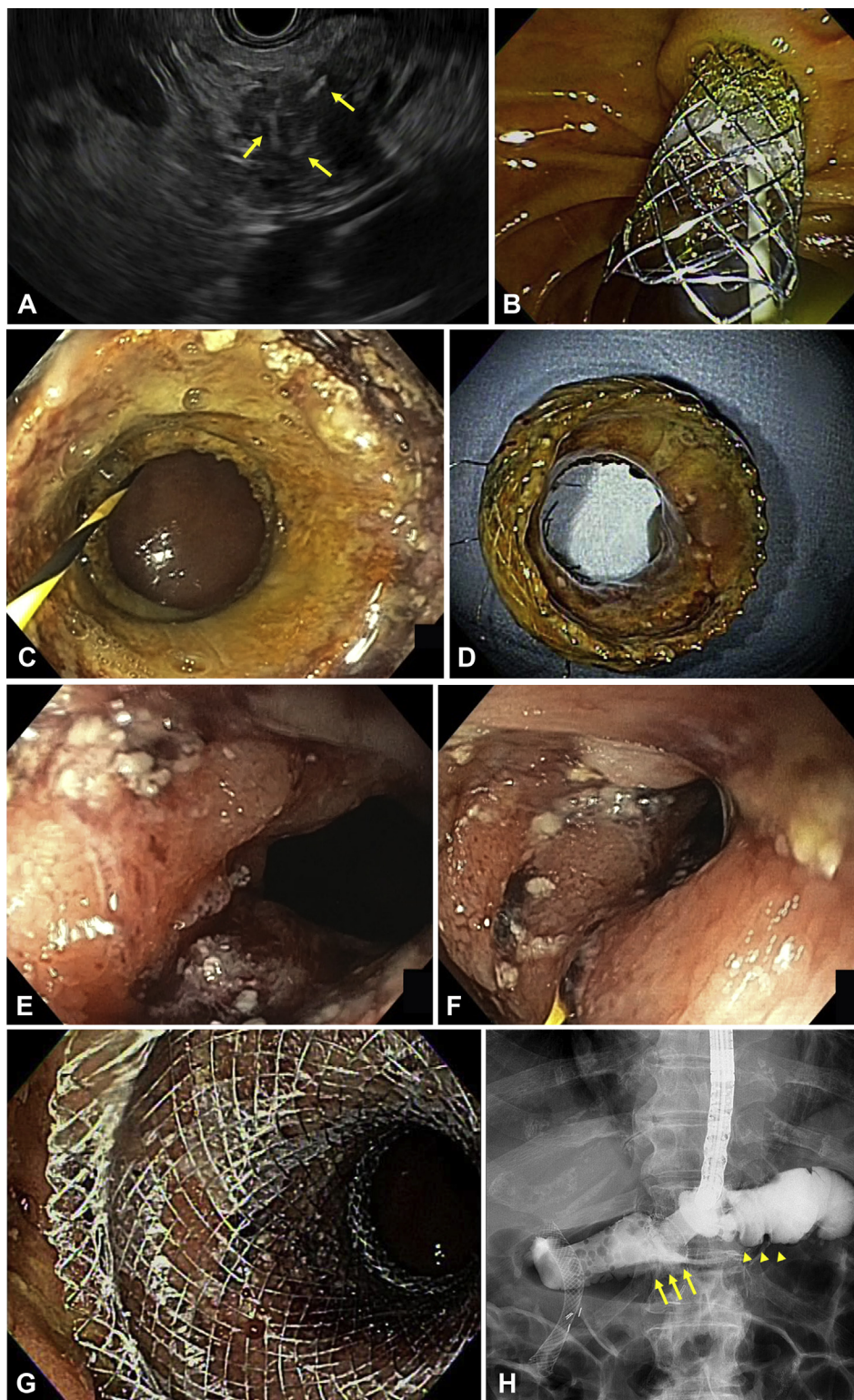


Figure 2. Subsequent follow-up. **A**, After the patient completed chemotherapy, we planned to start radiation therapy. EUS-guided fiducial placement (*arrows*) was performed across the LAMS. Of note, the biliary stent had spontaneously migrated and is no longer seen on EUS. **B**, A repeat ERCP was performed across the LAMS, with placement of a partially covered self-expanding metal biliary stent. **C**, The existing LAMS was notable for deterioration of the inner plastic coating. A 0.035-in guidewire was left in place across the jejunogastric access tract, and **(D)** the LAMS was extracted. **E, F**, Endoscopic views of a stable jejunogastric fistula tract. **G**, A new 20- × 10-mm LAMS was deployed across the jejunogastric fistula. **H**, Final fluoroscopic image showing intact LAMS and biliary stent, with contrast flowing into both the remnant stomach (*arrows*) and Roux limb (*arrowheads*).

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